

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

AMENDMENTS TO THE CLAIMS:

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) A portable measuring device comprising:
  - a housing;
  - power supply means;
  - ~~a processor and~~ one or more motion sensors adapted to detect motion in six degrees of freedom;
  - a processor adapted to provide a measure of the relative spatial separation of at least first and second locations;
  - a user actuated trigger for identifying at least said a first location; and
  - a display for visually presenting information on a measured relative spatial separation;  
wherein ~~said one or more motion sensors detect motion in six degrees of freedom and~~ said processor is further adapted to determine at least one angle of a second location with reference to a line or plane incorporating said first location as a measure of said relative spatial separation for presentation by said display and to determine an error correction in relation to motion detected by said one or more motion sensors.

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

2. (previously presented) The portable measuring device as claimed in claim 1, wherein said processor is adapted to determine said at least one angle with respect to one or both of vertical and horizontal planes.

3. (currently amended) The portable measuring device as claimed in claim 2, wherein said processor is adapted to determine whether said first location and said second locations-are level with respect to either of said vertical or horizontal planes.

4. (previously presented) The portable measuring device as claimed in claim 1, wherein said processor is adapted to determine, in addition to said at least one angle, a linear distance separating said first and second locations.

5. (currently amended) A portable measuring device comprising:  
a housing;  
power supply means;  
a processor and one or more motion sensors adapted to provide a measure of the relative spatial separation of at least first and second locations;  
a user actuated trigger for identifying at least said first location; and  
a display for visually presenting information on a measured relative spatial separation

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

wherein said processor is further adapted to determine at least one angle of said second location with reference to a line or plane incorporating said first location and a linear distance as a measure of said relative spatial separation for presentation by said display and to determine an error correction in relation to motion detected by said one or more motion sensors.

6. (currently amended) A portable measuring device comprising:

    a housing;

    power supply means;

    a processor and one or more motion sensors adapted to provide a measure of the relative spatial separation of at least first and second locations;

    a user actuated trigger; and

    a display for visually presenting information on a measured relative spatial separation

    said measuring device further including a measuring point provided on said housing having a defined spatial relationship with respect to said one or more motion sensors, said measuring point being provided for identification to said processor, in association with said user actuated trigger, at least one of said first and second locations and said processor being adapted to determine an error correction in relation to motion detected by said one or more motion sensors.

Appl. No. 10/534,639

Amdt. dated February 22, 2007

Reply to Office Action of September 22, 2006

7. (previously presented) The portable measuring device as claimed in claim 6, wherein said measuring point is visually distinguishable on said housing and user alignable with a user selected spatial location.

8. (previously presented) The portable measuring device as claimed in claim 6, wherein said measuring point is adapted to be substantially stationary when aligned by a user with a selected spatial location.

9. (previously presented) The portable measuring device as claimed in claim 8, wherein processor is adapted to determine an error correction when said measuring point is aligned with a selected spatial location and is substantially stationary, in relation to motion detected by said one or more motion sensors.

10. (canceled)

11. (previously presented) The portable measuring device as claimed in claim 6, wherein the processor is in communication with a volatile memory in which is stored calibration data and the processor is adapted to update calibration data stored in said volatile memory at a second or subsequent location.

12. (canceled)

13. (previously presented) The portable measuring device as claimed in claim 11, wherein said processor is adapted to adjust for movement of the one or more motion sensors as a result of uncontrolled hand movements of the user when updating calibration data stored in said volatile memory.

14. (canceled)

15. (currently amended) A portable measuring device as claimed in claim 6, ~~comprising a plurality of wherein said one or more motion sensors consisting of comprise~~ at least three accelerometers and three angular rate sensors.

16. (canceled)

17. (canceled)

18. (previously presented) The portable measuring device as claimed in claim 6, further including a timer, in communication with the processor, for monitoring the time duration of a measurement wherein the processor is adapted to determine the measure of relative spatial separation to a resolution dependent upon the time duration of the measurement.

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

19. (previously presented) The portable measuring device as claimed in claim 6, wherein the processor is adapted to determine from information received from the motion sensors when the measuring device is stationary and to generate an error correction.

20. (previously presented) The portable measuring device as claimed in claim 6, wherein the processor has access to threshold data identifying lower limits of measurable spatial movement representative of small, uncontrolled hand movements of a user.

21. (previously presented) The portable measuring device as claimed in claim 6, further comprising a deceleration device for reducing high deceleration forces.

Claims 22-25 (canceled)

26. (previously presented) The portable measuring device as claimed in claim 6, wherein the processor is adapted to supply real time data on the measured relative spatial separation.

27. (canceled)

28. (previously presented) The portable measuring device as claimed in claim 6, wherein the processor additionally includes a data store in which motion data is stored and said processor is adapted to update said stored motion data in dependence on calculated error corrections or

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

updated calibration data and to recalculate said measured spatial separation in dependence on the updated motion data.

29. (canceled)

30. (previously presented) The portable measuring device as claimed in claim 6, further including a non-contact distance meter for measuring a distance to a position remote from the measuring device, the position being at least one of said first and second locations.

31. (New) A portable measuring device as claimed in claim 1, further comprising a measuring point provided on said housing and having a defined spatial relationship with respect to said one or more motion sensors, said measuring point being visually distinguishable on said housing and user alignable with a user selected spatial location.

32. (New) A portable measuring device as claimed in claim 31, wherein said measuring point is adapted to be substantially stationary when aligned by a user with a selected spatial location.

33. (New) A portable measuring device as claimed in claim 32, wherein the processor is adapted to determine an error correction when said measuring point is aligned with a

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

selected spatial location and is substantially stationary, in relation to motion detected by said one or more motion sensors.

34. (New) A portable measuring device as claimed in claim 1, wherein the processor is in communication with a memory in which is stored calibration data and the processor is adapted to update calibration data stored in said memory at a second or subsequent location.

35. (New) A portable measuring device as claimed in claim 34, wherein said processor is adapted to adjust for movement of the one or more motion sensors as a result of uncontrolled hand movements of the user when updating calibration data stored in said memory.

36. (New) A portable measuring device as claimed in claim 1, comprising a plurality of motion sensors comprising at least three accelerometers and three angular rate sensors.

37. (New) A portable measuring device as claimed in claim 1, further including a timer, in communication with the processor, for monitoring the time duration of a measurement wherein the processor is adapted to determine the measure of relative spatial separation to a resolution dependent upon the time duration of the measurement.

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

38. (New) A portable measuring device as claimed in claim 1, wherein the processor is adapted to determine from information received from the motion sensors when the measuring device is stationary and to generate an error correction.

39. (New) A portable measuring device as claimed in claim 1, wherein the processor has access to threshold data identifying lower limits of measurable spatial movement representative of small, uncontrolled hand movements of a user.

40. (New) A portable measuring device as claimed in claim 1, further comprising a deceleration device for reducing high deceleration forces.

41. (New) A portable measuring device as claimed in claim 1, wherein the processor is adapted to supply real time data on the measured relative spatial separation.

42. (New) A portable measuring device as claimed in claim 1, wherein the processor additionally includes a data store in which motion data is stored and said processor is adapted to update said stored motion data in dependence on calculated error corrections or updated calibration data and to recalculate said measured spatial separation in dependence on the updated motion data.

Appl. No. 10/534,639  
Amdt. dated February 22, 2007  
Reply to Office Action of September 22, 2006

43. (New) A portable measuring device as claimed in claim 1, further including a non-contact distance meter for measuring a distance to a position remote from the measuring device, the position being at least one of said first and second locations.